

The botany of Slover mountain.

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This is not a large mountain, rising hardly 500 feet above the mesas of the San Bernardino valley, in southern California, where it is situated. One can ride around it on level ground in a circuit of some two miles, for it is quite isolated from the neighboring range of hills. They are of the prevailing granitic formation of the region, while Slover is one of a very few protrusions of limestone, affording to the surrounding towns good lime and a fair quality of marble. To these economic advantages it doubtless owes the dignity of a name in a country where many more considerable elevations are left without one.

Everywhere it is very steep, and in places inaccessible. Its sides, for the most part, are of bare rock, and where there is soil it is thin and stony. It is without springs, so that the only moisture it obtains is from the scanty rain of the short winter.

One would expect the plants inhabiting such an arid rock to be few in number and of little interest. But in reality it possesses a vegetation of a very remarkable character. Not only is it well supplied with a considerable number of the commoner plants of the surrounding hills, but it also contains within its narrow limits a half-dozen species not found elsewhere for a distance of from 40 to over 100 miles. And it is noteworthy that several of these species, coming from several points of the compass, find here a common limit of their known ranges.

From the north there is *Cheilanthes Cooperæ* Eaton, elsewhere known at only three stations, the nearest at Santa Barbara. It is not abundant here, and grows mostly in deep fissures of the cliffs on the southwestern face, although a few plants may be found in other sheltered spots. Of this fern Slover is the southern limit. Several species come in from the deserts that lie to the east of the main range.

Notholæna cretacea Liebm., the *N. candida* of the Botany of California, is to be found in the seams of the rocks, exposed to the full blaze of the sun. Into such narrow cracks does it force its roots that actual quarrying is often necessary

to procure specimens. Like so many of the ferns of the southwest its fronds are curled up in summer in brittle knots that crumble at the touch, but expand and live again at the coming of the rainy season. In their exposed situation the Slover *Notholænas* lead an unusually intermittent life, unrolling their fronds at every shower and contracting them again with every dry wind from the north. The white-powdered form and the yellow-powdered are equally abundant, but the plants are smaller than those of the desert, where they often grow about the edges of boulders with their roots in the soil beneath. It is also found on the dry hills about San Diego, where several desert plants reach the sea. Our station is perhaps the westernmost one. It certainly is of *Erodium Texanum* Gray, whose eastern origin is indicated by its name, and which I have collected on the very summit. Elsewhere in this state it has been found springing up at a few places on the Mojave and the Colorado deserts.

Allium unifolium Kellogg, abundant on a stony northern slope, belongs to the west and north, in the coast range, and finds here its eastern limit. *Sisymbrium reflexum* Nutt., and *Amsinckia intermedia* F. & M., are to be noted as occurring here, quite away from their usual range. Both are not uncommon on the edge of the deserts, and the latter is also reported to grow near the coast.

Slover has also its own peculiar species, *Delphinium Parishii* Gray, which has as yet been discovered nowhere else. Its aspect suggests that it also may be an outlying member of the desert flora.

Why this insignificant hill should have so peculiar a flora is an interesting problem in geographical botany. That a particular species should be found only in a certain spot, or at least not in any similar one for many miles in any direction, is not uncommon in this region. It is true that this isolation in some cases may be only seeming, and due to a lack of thorough knowledge of the surrounding country, but it occurs too frequently in well explored ground not to be accepted as real. It is indeed one of the characteristics of our flora.

But here we have not one, as is usual, but seven isolated species gathered together in an area of a few acres. The geological formation of the mountain, so different from its neighbors, might appear to account for its peculiar vegetation. But in other places none of these species grow in calcareous soil, nor are they to be found on another outcrop-

ping of limestone a few miles away. Of the six species known to grow elsewhere, four belong to the deserts. But against the connection suggested by this fact is to be set the northern derivation of the two remaining species, so that no satisfactory solution presents itself.

NOTE. Since these notes were written Mr. T. S. Brandege has published in the 25th volume (series II) of the Proceedings of the California Academy of Science, his valuable paper on the "Plants of Baja California." Mr. Brandege finds *Delphinium Parishii* on the Californian peninsula from San Enrique northward. Slover mountain therefore becomes its northernmost habitat.

San Bernardino, Cal.

Notes on North American Willows. V.

M. S. BEBB.

I. SALIX HOOKERIANA, again. During the year 1835, Abraham Halsey, Esq., of Hartford, Connecticut, made a number of drawings for Dr. Barratt, designed to illustrate a work on North American Willows, which was never published. These drawings are now the property of Columbia College, and last summer Dr. Britton—thinking I might be interested—kindly sent them to me for inspection. They represent for the most part the species common about Dr. Barratt's home in Middletown, Conn., but among them I find one of *S. Hookeriana*, and under this, in Dr. Barratt's own handwriting, the following inscription: "*Salix Hookeriana* Barratt, n. sp. Herb. H. B. & T. no. 9. N. W. Coast from Mr. Scouler"! There is also a crude water-color (not done by Mr. Halsey) obviously worked-up from a tracing of herbarium specimens, and under this a repetition of the habitat and name of collector as given above. No botanist comparing the two sketches with the plate in the *Flora Boreali Americana* would fail to perceive that all three were drawn from specimens of a single gathering. Than this, nothing could be more satisfactory and conclusive. To Mr. Scouler belongs exclusively the credit of discovering this most remarkable willow, and the Saskatchewan habitat, which has all along held the first place in the books, and is the only one given by Andersson, is shown to have been a mistake from the beginning!